

REMARKS

Status of Claims

Claims 8 and 9 remain pending and under examination on the merits in the present application. Applicants and their attorney gratefully acknowledge that Claim 9 has been allowed. Claim 8 has been rejected, as discussed further hereinafter.

Claim 1 has been cancelled by the foregoing amendments, with reservation of Applicants' right to file one or more divisional applications directed to the subject matter thereof. Claims 2-7 remain cancelled as because they are directed to an invention elected for prosecution in the recently allowed parent application (i.e., U.S. Application No. 10/117,859, filed April 8, 2002 and issued as Pat. No. 6,740,620).

Claim Rejections Under 35 U.S.C. § 103(a)

On pages 2-5 of the final Office Action, Claim 8 has been rejected, under 35 U.S.C. § 103(a), as being obvious and unpatentable over Ushikubo et al. (US5380933). Applicant respectfully traverse this rejection for the following reasons.

The process of the present invention, as recited in relevant part in Claim 8, requires that a vapor phase catalytic oxidation reaction occur in the presence of an orthorhombic phase mixed metal oxide catalyst produced by a process which includes the step of "(b) admixing a seeding effective amount of an orthorhombic phase mixed metal oxide seed, substantially free of hexagonal phase mixed metal oxide, with said solution to form a seeded solution".

Initially, it is noted that the process of Claim 8 requires that the process for producing an unsaturated carboxylic acid occur in the presence of an orthorhombic phase mixed metal oxide catalyst, which Ushikubo et al. fails to teach or suggest in any way. Rather, the catalysts taught by Ushikubo et al. are multiphase catalysts, which include the hexagonal phase. The hexagonal phase is substantially absent from the catalysts used in the process of the present invention. Thus, Ushikubo et al. fails to suggest the process of the present invention as recited in Claim 8.

Furthermore, it is respectfully submitted that the Examiner has erroneously concluded that the addition of a compound containing one of the catalyst precursors (i.e., addition of a

solution of ammonium niobium oxalate, which contains the precursor Nb) to the precursor mixture, as taught by Ushikubo et al., is analogous to step (b) of Claim 8 which requires “admixing a seeding effective amount of an orthorhombic phase mixed metal oxide seed, substantially free of hexagonal phase mixed metal oxide, with said solution to form a seeded solution”. It is respectfully noted that these steps are not at all the same or analogous, for the reasons which follow.

As is stated concisely in paragraph [0022] of the present specification (published version, US 2004/0176244), “[i]t has now been found that the orthorhombic phase (phase B) can be prepared selectively, in quantitative yield, by seeding the catalyst precursor solution with orthorhombic phase (phase B) material. ” Claim 8 recites that the seed is “orthorhombic phase mixed metal oxide seed, substantially free of hexagonal phase mixed metal oxide” (emphasis added). Furthermore, Paragraphs [0049] to [0059] of the present specification consistently and effectively identify the “seed” as a mixed metal oxide which is compositionally the same as the mixed metal oxide of the catalyst of the present invention (see paragraphs [0036] to [0038] and the claims). In addition, Example 1 of the present application reinforces that the “seed” and the catalyst are both comprised of compositionally similar mixed metal oxides (i.e., Mo-V-Te-Nb-based oxides). It is further noted that calcination is required to form a mixed metal oxide, having crystal structures, from a mixture of precursor elements, so until the precursor is calcined, it is not a mixed metal oxide. Thus, it is respectfully submitted that, based upon the plain language of Claim 8, the general knowledge in the relevant art, and the disclosure and examples provided in the present specification at paragraphs [0022] and [0049] to [0059], the “seeding” step of Claim 8 requires addition to the precursor mixture of a seed which is a mixed metal oxide comprised of similar (but not necessarily identical) composition to the mixed metal oxide precursor to which it is to be added, to ultimately form the preferred orthorhombic phase mixed metal oxide catalyst upon calcination.

According to the steps of Claim 8, compounds of the required precursor elements (A, V, N and X) and at least one solvent are admixed to form a solution, and then a seeding effective amount of an orthorhombic phase mixed metal oxide seed is admixed therewith to form a seeded

precursor solution, which is then calcined to produce the orthorhombic phase catalyst. The addition of a solution of ammonium niobium oxalate is, in fact, the same as (or, more accurately, a part of) the step of forming the precursor solution by mixing compounds of the required precursor elements. The subsequent seeding step of the present invention requires addition to the precursor solution of a seeding effective amount of an orthorhombic phase mixed metal oxide seed, and ammonium niobium oxalate is not an orthorhombic phase mixed metal oxide seed.

A solution of ammonium niobium oxalate is clearly not the same as, nor is it analogous to, an orthorhombic phase mixed metal oxide seed, regardless of the amount added because a solution of ammonium niobium oxalate is not and does not contain an orthorhombic phase mixed metal oxide, but rather, it contains only a compound of niobium – i.e., ammonium niobium oxalate. Furthermore, a solution of ammonium niobium oxalate is not compositionally the same as the mixed metal oxide of the catalyst to be formed, which compositional similarity is also required by the present invention recited in Claim 8. More particularly, to be compositionally the same, the solution would have to contain the elements A, V, N and X as defined in the present invention and selected in practice in a particular embodiment, and even then, such a solution would only be a mixture of such elements and would not be a mixed metal oxide containing those elements, as required by the present invention recited in Claim 8.

Thus, the Examiner's conclusion that the teaching of Ushikubo et al. to add a solution of ammonium niobium oxalate to the precursor mixture in any way suggests the addition of an orthorhombic phase mixed metal oxide seed to the precursor mixture (to encourage formation of the preferred orthorhombic phase upon calcination of the precursor mixture) is erroneous and misunderstands the process disclosed in Ushikubo et al. and the process of the present invention as recited in Claim 8.

Based upon the foregoing discussion, it is respectfully submitted that Ushikubo et al. fails to suggest, explicitly or otherwise, the process of Claim 8 which requires that the catalyst be prepared by a process which includes the step of "(b) admixing a seeding effective amount of an orthorhombic phase mixed metal oxide seed, substantially free of hexagonal phase mixed metal oxide, with said solution to form a seeded solution". In view of the foregoing comments and

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discussion, withdrawal of the rejection of Claim 8, under 35 U.S.C. § 103(a), is hereby respectfully requested.

Conclusion

It is believed that the foregoing amendments place the present application in condition for allowance and will not require any further searching by the Examiner. Thus, entry of the foregoing amendments and allowance of the present application, including Claims 8 and 9, are hereby respectfully requested.

No fees are believed to be due in connection with the submission of this Amendment. If, however, any such fees, including petition and extension fees, are due in connection with the submission of this Amendment, the Commissioner is hereby authorized to charge such fees to **Deposit Account No. 18-1850**. In the meantime, please direct all future correspondence relating to the present application to the undersigned attorney.

Respectfully submitted,


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